Last Modified: 7-13-2007		1.6 U
Service Category: Vehicle Exterior	**Section:** Lighting (ext)	
Model Year: 2008	**Model:** ES350	**Doc ID:** RM0000011SA00CX
Title: LIGHTING: LIGHTING SYSTEM: FAIL-SAFE CHART (2008 ES350)		

FAIL-SAFE CHART

1. HID headlight system

The light control ECU operates in the fail-safe mode if an abnormal condition such as those listed below has been detected.

ITEM	OUTLINE
Detection of abnormal input voltage (High input voltage)	If voltage that is input to the light control ECU is approximately 20 V or more, the ECU stops illuminating the headlights, and resumes when the voltage drops to 16 V or less.
Detection of abnormal input voltage (Low input voltage)	If voltage that is input to the light control ECU is 6 V or less, the ECU stops illuminating the low beam headlights, and resumes when the voltage is 10 V or more.
Detection of abnormal output ● Open in output side circuit ● Short between output terminals ● Short between output terminal and body ground	If an abnormal condition occurs in the voltage that is output by the light control ECU, the ECU stops illuminating the low beam headlights and will maintain this state until the power is reinstated (by turning the light control switch from OFF to HEAD)
Detection of bulb flashing	If the bulb flashing repeats within approximately 5 seconds and continues for approximately 60 seconds, the light control ECU stops illuminating low beam headlights and will maintain this state until the power is reinstated (by turning the light control switch from OFF to HEAD)
Detection of abnormal light voltage (Low light voltage)	After approximately 80 seconds since input voltage is supplied, if the light voltage is below approximately 31 V for approximately 0.5 seconds, the light control ECU stops illuminating the low beam headlights and will maintain this state until the power is reinstated (by turning the light control switch from OFF to HEAD)
Detection of abnormal light voltage (High light voltage)	If the light voltage is above approximately 69 V for approximately 0.5 seconds, the light control ECU stops illuminating the low beam headlights and will maintain this state until the power is reinstated (by turning the light control switch from OFF to HEAD)

2. Automatic headlight beam level control system

If the AFS ECU detects a malfunction in the automatic headlight beam level control system or intelligent AFS, it will take the actions indicated in the table below.

with Intelligent AFS:

TROUBLE AREA	CONDITION (FAIL-SAFE CONTROL FOR AUTOMATIC HEADLIGHT BEAM LEVEL CONTROL)	AFS OFF INDICATOR LIGHT

Headlight Swivel Motor Malfunction	Continues control until a position that is 0.65° less than the current position is reached.	Flash
Steering Angle Sensor Signal Malfunction	Continues control.	Flash
Speed Sensor Signal Malfunction	• Continues to control using the normal speed sensor signal if one signal fails. • Judges that the vehicle speed is 0 km/h and continues to control if both speed sensor signals fail.	Flash
Height Control Sensor Signal Malfunction	• Stops the operation after returning to the initial position (Fail at higher than the initial position). • Stops the operation at the current position (Fail at lower than the initial position).	Flash
Headlight Leveling Motor Malfunction	Normal Side Headlight Leveling Motor • Stops the operation after returning to the initial position (Fail at higher than the initial position). • Stops at the current position (Fail at lower than the initial position).	Flash
	Abnormal Side Headlight Leveling Motor • Stops at the current position.	
Communication Signal Malfunction	Skid Control ECU: • Judges that the vehicle speed is 0 km/h (0 mph) and continues control.	Flash
	Steering Angle Sensor: • Normally controls the system.	

without intelligent AFS:

TROUBLE AREA	CONDITION (FAIL-SAFE CONTROL FOR AUTOMATIC HEADLIGHT BEAM LEVEL CONTROL)	MASTER WARNING LIGHT	MULTI-INFORMATION DISPLAY
Speed Sensor Signal Malfunction	• Continues control using the normal speed sensor signal if one signal fails. • Judges that the vehicle speed is 0 km/h and continues to control if both speed sensor signals fail.	ON	CHECK HEADLIGHT
Height Control Sensor Signal Malfunction	• Stops the operation after returning to the initial position (Fail at higher than the initial position). • Stops the operation at the current position (Fail at lower than the initial position).	ON	CHECK HEADLIGHT
Headlight Leveling Motor	Normal Side Headlight Leveling Motor • Stops the operation after returning to the initial position (Fail at higher than the initial position). • Stops at the current position (Fail at lower than	ON	CHECK HEADLIGHT

Malfunction	the initial position). Abnormal Side Headlight Leveling Motor ● Stops at the current position.		
Communication Signal Malfunction	Skid Control ECU: ● Judges that the vehicle speed is 0 km/h (0 mph) and continues control.	ON	CHECK HEADLIGHT

3. Intelligent AFS

If the AFS ECU detects a malfunction in the intelligent AFS or automatic headlight beam level control system, it will take the actions indicated in the table below.

TROUBLE AREA	CONDITION (FAIL-SAFE CONTROL FOR INTELLIGENT AFS CONTROL)	AFS OFF INDICATOR LIGHT
Headlight Swivel Motor	Normal Side Headlight Swivel Motor: ● Stops operating after returning to the initial position.	Flash
	Abnormal Side Headlight Swivel Motor: ● Stops at the current position.	
Steering Angle Sensor Signal Malfunction	Stops operating after returning to the initial position.	Flash
Speed Sensor Signal Malfunction	Stops operating after returning to the initial position.	Flash
Height Control Sensor Signal Malfunction	Stops operating after returning to the initial position.	Flash
Headlight Leveling Motor	Stops operating after returning to the initial position.	Flash
Communication Signal Malfunction	Main Body ECU: ● Stops operating after returning to the initial position.	Flash
	ECM: ● Stops operating after returning to the initial position.	
	Skid Control ECU: ● Stops operating after returning to the initial position.	
	Steering Angle Sensor: ● Stops operating after returning to the initial position.	

4. Automatic light control system

If the main body ECU detects a malfunction in the automatic light control sensor, the main body ECU effects fail-safe control to prohibit the automatic light control. If the low beam headlights and taillights are on, the lights will remain on

until the light control switch is turned off.